

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Kenneth R. Owens, et al.  
Serial No.: 09/692,884  
Filing Date: October 20, 2000  
Confirmation No.: 6113  
Group Art Unit: 2616  
Examiner: Jason E. Mattis  
Title: METHOD FOR ESTABLISHING AN MPLS DATA  
NETWORK PROTECTION PATHWAY

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

REPLY BRIEF

In response to the Examiner's Answer issued January 2, 2008, Applicant respectfully submits this brief in reply.

Applicant has appealed to the Board of Patent Appeals and Interferences from the Final Action of the Examiner issued August 22, 2006 finally rejecting Claims 1-24. In response to the Notice of Panel Decision from Pre-Appeal Brief Review issued May 14, 2007, Applicant respectfully submits herewith its brief on appeal.

REAL PARTY IN INTEREST

The present Application was assigned to Tellabs Operations, Inc., a Delaware corporation, as indicated by an Assignment from the inventors recorded on April 13, 2001 in the Assignment Records of the United States Patent and Trademark Office at Reel 011737, Frames 0518-0526.

RELATED APPEALS AND INTERFERENCES

There are no known appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in this pending appeal.

STATUS OF CLAIMS

Claims 1-24 stand rejected pursuant to a Final Action issued August 12, 2006. Claims 1-24 are all presented for appeal.

STATUS OF AMENDMENTS

A Response to Examiner's Action was filed on March 11, 2004 in response to an Office Action issued January 30, 2004. Claims 1-16 were amended. A Response to Examiner's Final Action was filed on July 22, 2004 in response to a Final Action issued May 24, 2004. No further amendments were made to the claims. A Request for Continued Examination was filed on November 8, 2004 in response to a Final Action issued September 7, 2004. Claims 1-3, 9, 10, 12, and 16 were amended and Claims 17-24 were added. A Response to Examiner's Action was filed on April 26, 2005 in response to an Office Action issued January 26, 2005. Claims 1, 9, 10, 16-18, 20, and 23 were amended. A Response to Examiner's Final Action was filed on September 19, 2005 in response to a Final Action issued July 19, 2005. No further amendments were made to the claims. A Notice of Appeal was filed on November 21, 2005 in response to an Advisory Action issued November 10, 2005. Upon reopening prosecution, a Response to Examiner's Action was filed on May 30, 2006 in response to an Office Action issued February 27, 2006. Claim 17 was amended. A Response to Examiner's Final Action was filed on October 23, 2006 in response to an Office Action issued August 22, 2006. No further amendments were made to the claims. A Notice of Appeal and Request for Pre-Appeal Brief Review were filed on December 21, 2006 in response to an Advisory Action issued November 16, 2006. A Notice of Panel Decision from Pre-Appeal Brief Review issued on May 14, 2007 stating that the appeal is to proceed to the Board of Patent Appeals and Interferences.

SUMMARY OF CLAIMED SUBJECT MATTER

With respect to Independent Claim 1, a method of establishing a traffic flow over a protection path from a source switch 102 to a destination switch 112 through a second set of switches 104-110 in a multi-protocol label switching system (MPLS) data network comprised of a plurality of data switches that are interconnected to form a plurality of data paths from a source node to a destination node through a first set of data switches is provided. (See FIG. 1 and page 7, lines 6-9). The method includes sending a first predetermined message 210, from a first switch 202 to a second switch 204, the first predetermined message 210 establishing at least a working path and a protection path for the traffic flow through the network between the first 202 and second 204 switches. (See FIG. 2 and page 26, lines 5-7). A second predetermined message 214 is sent from the second switch 204 to the first switch 202, the second predetermined message 214 establishing a reverse notification path through the network between the second 204 and the first 202 switches. (See FIG. 2 and page 26, lines 9-11). A third message 220 is sent over the reverse notification path, from the second switch 204 to the first switch 202, in response to the second switch 204 receiving the traffic flow over the working path from the first switch 202 in order to control protection switching by the first switch 202. (See FIG. 2 and page 10, lines 2-5). The third message 220 indicates whether the traffic flow sent on the working path was received intact and on time by the second switch 204. (See FIG. 2 and page 9, lines 1-9).

With respect to Independent Claim 10, a method of routing traffic flow from a working path through a network to a protection path through the network in a multi-protocol label switching system (MPLS) data network comprised of a plurality of data switches that are interconnected to form a plurality of data paths from a source node 102 to a destination node 112 through the data switches 104-110 is provided. (See FIG. 1 and page 7, lines 6-9). The method includes sending a first predetermined control message 210, from a first switch 202 to a second switch 204, the first predetermined control message 210 establishing at least a working path and a separate protection path for the traffic flow through the network between the first 202 and second 204 switches. (See FIG. 2 and page 26, lines 5-7). A second predetermined control message 214 is sent from the second switch 204 to the first switch 202, the second predetermined message 214 establishing a reverse notification path through the network between the second 204 and said first 202 switches. (See FIG. 2 and page 26, lines 9-11. A third message 230 is sent over the reverse notification path from the second switch 204 to the first switch 202 in response to the second switch 204 receiving the traffic flow from the first switch 202 over the working path. (See FIG. 2 and page 10, lines 2-5). The interruption of the third message 230 controls protection switching by the first switch 202. (See FIG. 2 and page 10, lines 5-12).

With respect to Independent Claim 17, a system for establishing a traffic flow over a protection path in a data network is provided. (See FIG. 1 and page 7, lines 10-13). The system includes a plurality of switches 102-112 operable to route the traffic flow in the data network, a first one 102 of the plurality of switches operable to establish a working path and a protection path, a second one 104 of the plurality of switches that is downstream from the first one 102 of the plurality of switches being on the working path. (See FIG. 2 and page 26, lines 5-7). The second one 104 of the plurality of switches is operable to establish a reverse notification path to the first one 102 of the plurality of switches. (See FIG. 2 and page 26, lines 9-11). The second one 104 of the plurality of switches is operable to send a reverse notification message 230 upstream to the first one 102 of the plurality of switches in response to receiving the traffic flow from the first one 102 of the plurality of switches over the working path. (See FIG. 2 and page 10, lines 2-5). The reverse notification message 230 is operable to provide information related to the working path in order to determine whether the traffic flow is to be re-routed from the working path to the protection path. (See FIG. 2 and page 8, lines 17-21). The interruption of the reverse notification message controls protection switching by the first switch. (See FIG. 2 and page 10, lines 5-12).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

1. Claims 10, 11, and 13-24 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Published Application No. 2002/0181485 issued to Cao, et al. in view of U.S. Patent No. 6,697,329 issued to McAllister, et al.

2. Claims 1, 2, 4, 5, and 7-9 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Published Application No. 2002/0181485 issued to Cao, et al. in view of U.S. Patent No. 6,697,329 issued to McAllister, et al. and further in view of U.S. Patent No. 6,590,893 issued to Hwang, et al.

3. Claim 3 stands rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Published Application No. 2002/0181485 issued to Cao, et al. in view of U.S. Patent No. 6,697,329 issued to McAllister, et al. and U.S. Patent No. 6,590,893 issued to Hwang, et al. and further in view of U.S. Patent No. 6,594,268 issued to Aukia, et al.

4. Claim 12 stands rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Published Application No. 2002/0181485 issued to Cao, et al. in view of U.S. Patent No. 6,697,329 issued to McAllister, et al. and further in view of U.S. Patent No. 6,594,268 issued to Aukia, et al.

5. Claim 6 stands rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Published Application No. 2002/0181485 issued to Cao, et al. in view of U.S. Patent No. 6,697,329 issued to McAllister, et al. and further in view of U.S. Patent No. 6,452,942 issued to Lemieux.

ARGUMENT

1. Claims 10, 11, and 13-24 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Published Application No. 2002/0181485 issued to Cao, et al. in view of U.S. Patent No. 6,697,329 issued to McAllister, et al. According to M.P.E.P. §2143, to establish a prima facie case of obviousness, three criteria must be met. First, there must be some suggestion or motivation to combine the references. Second, there must be a reasonable expectation of success. Third, the prior art combination of references must teach or suggest all the claim limitations. The Examiner has not established that any criteria for a prima facie case of obviousness has been met in this instance.

First, there is no objective reason provided by the Examiner to combine the Cao, et al. application and the McAllister, et al. patent as proposed. The Examiner has failed to provide an objective reason that would have prompted a person of ordinary skill in the art to combine the Cao, et al. application and the McAllister, et al. patent. The Cao, et al. patent is directed to Internet Protocol flow ring protection switching in a label switched path network where protection switching is performed at a downstream router. The McAllister, et al. patent is directed to operator directed routing of connections in an asynchronous transfer mode network where re-routing is performed by the source node. The Examiner has not cited any objective reason showing any capability for them to be combined. The Examiner merely states that one of ordinary skill in the art would be motivated to provide the feature of the claimed invention, presumably taught by the McAllister, et al. patent, in the Cao, et al. application. The rationale provided by the Examiner for their combination is purely subjective conjecture



and speculation with no objective reasoning being provided to support combining the references as has been proposed. The Examiner is merely taking bits and pieces of unrelated subject matter in an improper hindsight attempt at reconstructing the claimed invention.

The Examiner merely provides a baseless and subjective conclusory "it would have been obvious to combine" statement using improper hindsight reconstruction without any support for such conclusory statements from the point of view of those skilled in the art. A statement that modifications of the prior art to meet the claimed invention would have been well within the ordinary skill of the art at the time the claimed invention was made because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. See M.P.E.P. 2143.01. Since the Examiner has used the claim language in a hindsight attempt to support the combination of the references and has not provided any proper reasoning, let alone objective reasoning for the combination of the Cao, et al. application and the McAllister, et al. patent, the burden to establish the first criteria of a prima facie case of obviousness has not been met.

In the Examiner's Answer, the Examiner relies on the assertion that the Cao, et al. application and the McAllister, et al. patent can be combined just because they deal with similar problems in similar environments. However, the Cao, et al. application and the McAllister, et al. patent do not deal with similar problems in similar environments. The Cao, et al. patent is directed to Internet Protocol (IP) flow ring protection switching in a label switched path IP network where

protection switching is performed at a downstream sink router. See Paragraph 0005 of the Cao, et al. application. The McAllister, et al. patent is directed to establishing a virtual circuit in an asynchronous transfer mode (ATM) network using operator directed routing of connections where re-routing is performed manually via an operator specified alternate route used by an upstream source node in event of a failure in the primary route. See col. 9, lines 1-5, and col. 10, lines 2-8, of the McAllister, et al. patent. Thus, the Cao, et al. application involves an IP network and the McAllister, et al. patent involves an ATM network. The Cao, et al. application performs protection switching at a downstream sink router while the McAllister, et al. patent performs alternate path routing at a source node. Accordingly, the Cao, et al. application and the McAllister, et al. patent address different problems in different parts of different types of networks. As a result, one of skill in the art would hardly consider the IP network and source node protection technique of the McAllister, et al. patent in addressing a problem in a label switched path network let alone how to perform protection switch routing at a sink router of the label switched path network as disclosed in the Cao, et al. application.

Moreover, the proposed modification changes the principle of operation of the prior art being modified. The Cao, et al. application is designed to perform protection switching at a downstream router in a label switched path network. The McAllister, et al. patent is designed to perform source node re-routing in an asynchronous transfer mode network. Thus, if the source node re-routing technique for an asynchronous transfer mode network was placed into label switched path network that uses a downstream router to perform protection

switching, the functionality of the Cao, et al. application could no longer be achieved. Accordingly, the principle of operation of the Cao, et al. application would be improperly changed by incorporating their respective teachings. The Examiner has yet to explain how the Cao, et al. application and the McAllister, et al. patent can be combined in view of such different functionalities. The Examiner states that it would be obvious or clear to one of ordinary skill in the art to combine the references. However, this subjective opinion provided by the Examiner has not been supported by any objective evidence. Therefore, Applicant respectfully submits that the Examiner has failed to establish the first criteria for a prima facie case of obviousness.

In the Examiner's Answer, the Examiner asserts that replacing the protection switching control method of the Cao, et al. application with the protection switching control method of the McAllister, et al. patent would not change the operation of the Cao, et al. patent. As shown above, the operation of the Cao, et al. application would be extremely affected by such a replacement. The Cao, et al. application would change from a sink router protection scheme to a source router protection scheme. Moreover, the Cao, et al. patent would change from employing explicit routing protocols to manual entry of preferred and alternate paths. The setting up of both working and protection paths would be different, affecting other operations of the system. As a result, the operation provided in the Cao, et al. application would become totally different from its original operation if the Examiner's proposed replacement is made.

Second, a reasonable expectation of success has not been shown by the Examiner. The combination of the Cao, et al. application and the McAllister, et al. patent would not be

capable of performing the operation required by the claimed invention. There is no showing by the Examiner that the functions of any of the Cao, et al. application and the McAllister, et al. patent would be able to operate in a single system. There has also been no showing that the combined references would even be able to perform the functionality of the claimed invention. The proposed combination attempts to combine incompatible processing techniques that have not been shown to be capable of operating according to any degree of predictability. The Cao, et al. application and the McAllister, et al. patent are addressing different problems. The Cao, et al. application of perform protection switching at a downstream router in a label switched path network provides a completely different operation than the source node re-route technique in an asynchronous transfer mode network of the McAllister, et al. patent. The Examiner, without the improper hindsight look through the claimed invention, has not addressed how the proposed combination of the cited references would have any success whatsoever let alone a reasonable expectation of success. Therefore, Applicant respectfully submits that the Examiner has failed to establish the second criteria for a prima facie case of obviousness.

In the Examiner's Answer, the Examiner merely reiterates that the replacement of the protection switching control method of the Cao, et al. application with the protection switching control method of the McAllister, et al. patent does not destroy the teachings of the Cao, et al. application since the two references deal with the same problem. As pointed out above, the Cao, et al. application and the McAllister, et al. patent deal with different problems in different parts of different networks. The principle of operation of the Cao, et al. patent is turned upside down if source node routing and

manual entry of preferred and alternate paths replaced the sink router and explicit routing protocols contemplated by the Cao, et al. application. Thus, the Examiner provides no objective basis that the proposed combination would have any success.

Third, the Examiner has not shown that the proposed Cao, et al. - McAllister, et al. combination teaches or suggests all of the claim limitations. As for teaching the claimed invention, the Examiner has not been able to show that the Cao, et al. application and the McAllister, et al. patent provide any capability at any of its nodes to determine whether traffic on a data path was received let alone an ability to provide such an indication along a reverse notification path as provided in the claimed invention. Moreover, the Cao, et al. application and the McAllister, et al. patent fail to use the interruption of this traffic indication message to control protection switching at the sending switch. In addition, the Cao, et al. application and the McAllister, et al. patent fail to disclose any capability to indicate that the traffic was received intact and on time.

Independent Claims 10 and 17 recite in general the ability to send a third message over a reverse notification path from a second switch to a first switch in response to the second switch receiving the traffic flow from the first switch over the working path, wherein the interruption of the third message controls protection switching by the first switch. By contrast, the Cao, et al. application performs protection switching at its downstream egress router by transmitting the same data along two different paths and allowing the downstream egress router to choose one of the paths as its primary source. Thus, there is no controlling of protection switching by a first switch in the Cao, et al. application as

required in the claimed invention. Moreover, the Examiner readily admits that the Cao, et al. application does not disclose the sending of the second and third messages of the claimed invention.

To support the deficiency in the Cao, et al. application, the Examiner cites the keep-alive polling process of the McAllister, et al. patent. However, the McAllister, et al. patent requires the constant sending of keep-alive protocol signaling messages and the return of acknowledgment signaling messages independent of the transfer of traffic flow over a working path in a network. The protocol and acknowledgment signaling messages, whether in the form of sequenced protocol message units or separately sequenced poll and stat messages, of the McAllister, et al. patent are not used to establish working or protection paths or a reverse notification path in its network, but merely to determine whether a first node receives a signaling message from a second node to which it can return an acknowledgment signaling message indicating that it is still operational. Moreover, the protocol and acknowledgment signaling messages are sent on direct node to node signaling paths separate from the data path in the network. The McAllister, et al. patent has no capability at any of its nodes to determine whether data on its data path was received let alone an ability to provide such an indication in a message along a reverse notification path as provided in the claimed invention. Any problems occurring in the data path of the McAllister, et al. patent would not be recognized as long as the protocol and acknowledgment messages are sent and received in a proper manner. Accordingly, the protocol and acknowledgment signaling messages have no relationship with the traffic flow in the network of the McAllister, et al. patent. Thus, the McAllister, et al.

patent does not send a third message from a second switch to a first switch in response to traffic flow being received at the second switch from the first switch over a working path that indicates whether traffic flow was received as required by the claimed invention. Moreover, the McAllister, et al. patent does not use the interruption of the third message to control protection switching by the first switch. When the McAllister, et al. patent detects a link failure, the functioning part of the network transmits a signal indicative of the failure and it is this signal that triggers an attempt to re-route the connection along a different path. See col. 10, lines 2-8, of the McAllister, et al. patent.

Moreover, the Cao, et al. application would not be able to use the acknowledgment messages generated by the McAllister, et al. patent as the Cao, et al. application would still perform protection switching at a downstream router by selecting one of two paths carrying the same data. The structure that would result from using the protocol and acknowledgment signaling messages transmitted along a signaling path independent of the data path as disclosed in the McAllister, et al. patent within the MPLS data network of the Cao, et al. application that implements an egress router for selection of one of two data paths carrying the same data would still lack sending of a third message, indicating whether traffic flow was received, by a second switch in response to receiving traffic flow from a first switch so that the first switch can control protection switching as required in the claimed invention.

The Examiner indicates that the claims are obvious from the McAllister, et al. patent in that the layer 3 P-NNI signaling messages and acknowledgments are part of the traffic flow and are sent in response to traffic flow being received.

However, the P-NNI signaling messages of the McAllister, et al. patent relied on by the Examiner in rejecting the claims are part of a signaling link 38 separate and apart from the data link 36. The P-NNI signaling messages establish a polling process for the signaling link 38. The P-NNI signaling messages are independent of whether traffic was received on the data link 36. Thus, the McAllister, et al. patent fails to provide any traffic indication message indicating whether traffic was received on its data link let alone received intact and on time as required in the claimed invention. Moreover, since there is no disclosure for the sending of this traffic indication message, the McAllister, et al. patent cannot control protection switching in response to an interruption of this traffic indication message. Thus, the Examiner's reliance on the McAllister, et al. application contradicts the features of the claimed invention. Therefore, Applicant respectfully submits that Claims 10, 11, and 13-24 are patentably distinct from the proposed Cao, et al. - McAllister, et al. combination.

In the Examiner's Answer, the Examiner asserts that the protocol and acknowledgment messages of the McAllister, et al. patent are sent over signaling links that are part of the data links. However, the signaling links of the McAllister, et al. patent are only associated with its data links and are shown as separate from the data links. See FIG. 3 and col. 6, lines 31-34, of the McAllister, et al. patent. The polling messages of the McAllister, et al. patent are sent over the signaling links while data is sent over the mutually exclusive data links. Moreover, the messages sent on the signaling links of the McAllister, et al. patent do not provide any indication concerning the data sent on the data links or the data links themselves, let alone whether the data was received. The



messages sent on the signaling links of the McAllister, et al. patent are merely 'heartbeat' or 'keep-alive' messages indicating that the signaling link between nodes is working. There is no correlation disclosed in the McAllister, et al. patent that these messages indicate that the data link is also working. Other than being polling messages, there is no disclosure in the McAllister, et al. patent as to what that these messages carry let alone carrying an indication as to the working path or that the data on the working path was received as required by the claimed invention. In addition, the polling messages of the McAllister, et al. patent are not used in establishing the working path and protection path as required by the claimed invention.

Thus, the Examiner has failed to establish the third criteria for a prima facie case of obviousness. As a result of the improper combination of the references, the lack of any expectation of success for the combination, and the lack of disclosure in the patents being combined by the Examiner, there is an insufficient basis to support the rejection of the claims.

2. Claims 1, 2, 4, 5, and 7-9 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Cao, et al. in view of McAllister, et al. and further in view of Hwang, et al. Independent Claim 1 recites ". . . the third message indicating whether the traffic flow sent on the working path was received intact and on time by the second switch." The Examiner cites the Hwang, et al. patent to support that a message is sent when data has been received without any errors. However, the Hwang, et al. patent fails to determine whether the data has been received on time as provided in the claimed invention. The Cao, et al. application and the McAllister, et al. patent are also silent with respect to determining whether data has been received on time as well as intact. Moreover, the deficiencies in the combination of the Cao, et al. application and the McAllister, et al. patent discussed above apply equally as well to Independent Claim 1. With respect to the combination with the Hwang, et al. patent, the Hwang, et al. patent discloses resending of data upon not receiving an acknowledgment signal that data was received intact. The functionality of the Hwang, et al. patent would make it incompatible with the Cao, et al. application and the McAllister, et al. patent to justify their combination. Therefore, Applicant respectfully submits that Claims 1, 2, 4, 5, and 7-9 are patentably distinct from the proposed Cao, et al. - McAllister, et al. - Hwang, et al. combination.

3. Claim 3 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Cao, et al. in view of McAllister, et al. and Hwang, et al. and further in view of Aukia, et al. Independent Claim 1, from which Claim 3 depends, has been shown above to be patentably distinct from the proposed Cao, et al. - McAllister, et al. - Hwang, et al. combination. Moreover, the Aukia, et al. patent does not include any additional disclosure combinable with either the Cao, et al. application, the McAllister, et al. patent, or the Hwang, et al. patent that would be material to patentability of these claims. Therefore, Applicant respectfully submits that Claim 3 is patentably distinct from the proposed Cao, et al. - McAllister, et al. - Hwang, et al. - Aukia, et al. combination.

4. Claim 12 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Cao, et al. in view of McAllister, et al. and further in view of Aukia, et al. Independent Claim 10, from which Claim 12 depends, has been shown above to be patentably distinct from the proposed Cao, et al. - McAllister, et al. combination. Moreover, the Aukia, et al. patent does not include any additional disclosure combinable with either the Cao, et al. application or the McAllister, et al. patent that would be material to patentability of these claims. Therefore, Applicant respectfully submits that Claim 12 is patentably distinct from the proposed Cao, et al. - McAllister, et al. - Aukia, et al. combination.

5. Claim 6 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Cao, et al. in view of McAllister, et al. and further in view of Lemieux. Independent Claim 1, from which Claim 6 depends, has been shown above to be patentably distinct from the proposed Cao, et al. - McAllister, et al. combination. Moreover, the Lemieux patent does not include any additional disclosure combinable with either the Cao, et al. application or the McAllister, et al. patent that would be material to patentability of this claim. Therefore, Applicant respectfully submits that Claim 6 is patentably distinct from the proposed Cao, et al. - McAllister, et al. - Lemieux combination.

CONCLUSION

Applicant has clearly demonstrated that the present invention as claimed is clearly distinguishable over all the art cited of record, either alone or in combination, and satisfies all requirements under 35 U.S.C. §§101, 102, and 103, and 112. Therefore, Applicant respectfully requests the Board of Patent Appeals and Interferences to reverse the final rejection of the Examiner and instruct the Examiner to issue a Notice of Allowance of all pending claims.

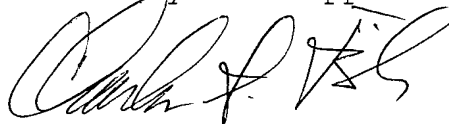
Please charge Deposit Account No. 02-0384 of BAKER BOTTS L.L.P. an amount of \$250.00 to satisfy the appeal brief fee of 37 C.F.R. §41.20(b)(2).

The Commissioner is hereby authorized to charge any fees or credit any overpayments associated with this Application to Deposit Account No. 02-0384 of BAKER BOTTS L.L.P.

Respectfully submitted,

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CLAIMS APPENDIX

1. (Previously Presented) In a multi-protocol label switching system (MPLS) data network comprised of a plurality of data switches that are interconnected to form a plurality of data paths from a source node to a destination node through a first set of data switches, a method of establishing a traffic flow over a protection path from a source switch to a destination switch through a second set of switches, said method comprises:

sending a first predetermined message, from a first switch to a second switch, said first predetermined message establishing at least a working path and a protection path for the traffic flow through said network between said first and second switches;

sending a second predetermined message, from said second switch to said first switch, said second predetermined message establishing a reverse notification path through said network between said second and said first switches; and

sending a third message over said reverse notification path, from said second switch to said first switch, in response to the second switch receiving the traffic flow over the working path from the first switch in order to control protection switching by said first switch, the third message indicating whether the traffic flow sent on the working path was received intact and on time by the second switch.

2. (Previously Presented) The method of Claim 1 wherein sending a first predetermined message is comprised of the step of adding a protection messaging field to a label distribution protocol (LDP) message, said protection messaging field carrying protection pathway information between MPLS network switch elements.

3. (Previously Presented) The method of claim 1 wherein sending a first predetermined message is comprised of the step of adding a protection messaging field in an MPLS reservation protocol message (RSVP), said protection messaging field carrying protection pathway information between MPLS network switch elements.

4. (Previously Presented) The method of claim 1 wherein sending at least a first predetermined message from said first switch to a second switch establishing at least a working path and a protection path includes:

identifying at least one switch of an MPLS network as a switch element by the contents of at least one control field in a message field of an MPLS message;

sending said at least one control field to at least one switch of said MPLS network.



5. (Previously Presented) The method of claim 1 wherein sending at least a first predetermined message from said first switch to a second switch, said first predetermined message establishing at least a working path and a protection path through said network between said first and second switches includes:

identifying at least one switch of an MPLS network as a protection switch element by the contents of at least one control field in a message field of an MPLS message;

sending said at least one control field to at least one switch of said MPLS network.

6. (Previously Presented) The method of claim 1 further including the step of label binding said first predetermined message from said second switch to a third switch.

7. (Previously Presented) The method of claim 1 wherein said working path is set up loosely.

8. (Previously Presented) The method of claim 1 wherein said working path is set up explicitly.

9. (Previously Presented) The method of claim 1 further including the step of mapping labels to the traffic flow routed along said working path according to predetermined criteria that includes the quality of service to be granted the traffic flow.

10. (Previously Presented) In a multi-protocol label switching system (MPLS) data network comprised of a plurality of data switches that are interconnected to form a plurality of data paths from a source node to a destination node through said data switches, a method of routing traffic flow from a working path through said network to a protection path through said network, said method comprising:

sending a first predetermined control message, from a first switch to a second switch, said first predetermined control message establishing at least a working path and a separate protection path for the traffic flow through said network between said first and second switches;

sending a second predetermined control message, from said second switch to said first switch, said second predetermined message establishing a reverse notification path through said network between said second and said first switches; and

sending a third message over said reverse notification path from said second switch to said first switch in response to said second switch receiving the traffic flow from said first switch over the working path, the interruption of which controls protection switching by said first switch.

11. (Previously Presented) The method of claim 10 wherein sending a first predetermined control message comprises:

adding a protection messaging field to a label distribution protocol (LDP) message, said protection messaging field carrying protection pathway information between MPLS network switch elements.

12. (Previously Presented) The method of claim 10 wherein sending a first predetermined control message comprises:

adding a protection messaging field in an MPLS reservation protocol message (RSVP), said protection messaging field carrying protection pathway information between MPLS network switch elements.

13. (Previously Presented) The method of claim 10 wherein sending a first predetermined control message, from a first switch to a second switch, includes:

identifying at least one switch of said MPLS network as a protection switch element by the contents of at least one data field in a message field of an MPLS message;

sending said at least one data field to at least one switch of said MPLS network.

14. (Previously Presented) The method of claim 10 wherein said working path is set up loosely.

15. (Previously Presented) The method of claim 10 wherein said working path is set up explicitly.

16. (Previously Presented) The method of claim 10 further including:

mapping labels to the traffic flow routed along said working path according to predetermined criteria that includes the quality of service to be granted the traffic flow.

17. (Previously Presented) A system for establishing a traffic flow over a protection path in a data network, comprising:

a plurality of switches operable to route the traffic flow in the data network, a first one of the plurality of switches operable to establish a working path and a protection path, a second one of the plurality of switches that is downstream from the first one of the plurality of switches being on the working path, the second one of the plurality of switches operable to establish a reverse notification path to the first one of the plurality of switches, the second one of the plurality of switches operable to send a reverse notification message upstream to the first one of the plurality of switches in response to receiving the traffic flow from the first one of the plurality of switches over the working path, the reverse notification message operable to provide information related to the working path in order to determine whether the traffic flow is to be re-routed from the working path to the protection path, the interruption of which controls protection switching by said first switch.

18. (Previously Presented) The system of Claim 17, wherein the first one of the plurality of switches is a protection switch element, the first one of the plurality of switches operable to re-route the traffic flow onto the protection path in accordance with the reverse notification message.

19. (Previously Presented) The system of Claim 17, wherein the first one of the plurality of switches is operable to generate and send upstream its own reverse notification message, the reverse notification message of the first one of the plurality of switches operable to include information from the reverse notification message received from the second one of the plurality of switches.

20. (Previously Presented) The system of Claim 17, wherein the first one of the plurality of switches is operable to initiate re-routing of the traffic flow in response to not receiving the reverse notification message from the second one of the plurality of switches within a predetermined time interval.

21. (Previously Presented) The system of Claim 17, wherein the reverse notification message informs the first one of the plurality of switches of a status of the second one of the plurality of switches and any other ones of the plurality of switches downstream from the first one of the plurality of switches on the working path.

22. (Previously Presented) The system of Claim 17, wherein the second one of the plurality of switches is operable to send its reverse notification message directly to each of the plurality of switches.

23. (Previously Presented) The system of Claim 17, wherein the second one of the plurality of switches is operable to send its reverse notification message directly to a particular one of the plurality of switches that performs protection switching for the traffic flow from the working path to the protection path.

24. (Previously Presented) The system of Claim 23, wherein the reverse notification message of the second one of the plurality of switches includes information pertaining to a failure in the working path.

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EVIDENCE APPENDIX

None

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RELATED PROCEEDINGS APPENDIX

None



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CERTIFICATE OF SERVICE

None